

An aerial photograph of a city, likely Washington D.C., showing a mix of urban buildings and green spaces. A large, semi-transparent circular graphic with a red border is centered over the image. Inside the circle, the words "VISION ZERO" are written in a large, bold, blue sans-serif font. The letter "O" in "ZERO" is replaced by the official seal of Montgomery County, which features a red, yellow, and blue design with a central emblem. Below the main title, a horizontal blue line separates it from the subtitle.

VISION ZERO

**NO TRAFFIC DEATHS BY 2030
IN MONTGOMERY COUNTY**

SUPPORTING DATA ANALYSIS

NOVEMBER 2017



ABOUT THIS DOCUMENT

This document is an addendum to the County's Vision Zero Two-Year Action Plan. It provides additional context to the data presented in the plan and extra analyses for further insights into the County's crashes.

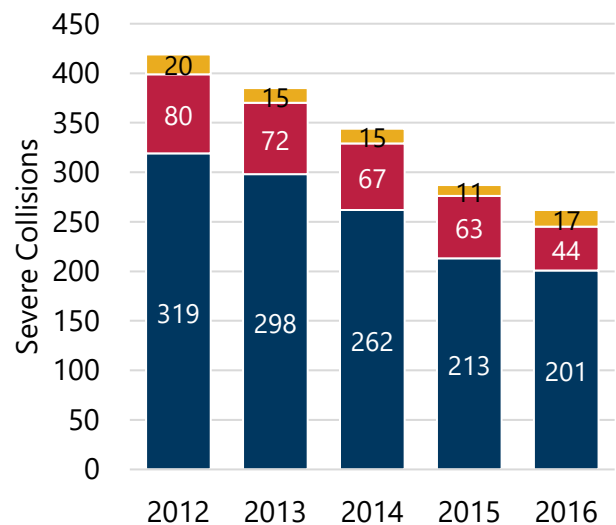
2012-2016 COLLISION TRENDS

In developing the Two-Year Action Plan, collision data collected by the Montgomery County Police Department (MCPD) covering 2012 to 2016 were analyzed. There were 1,849 collisions that resulted in 1,996 severe injuries and 174 fatalities to drivers, passengers, pedestrians, and bicyclists. During this period, the number of severe collisions declined 37%, but fatal collisions increased 58%. The majority of the increase was for vehicle occupants.

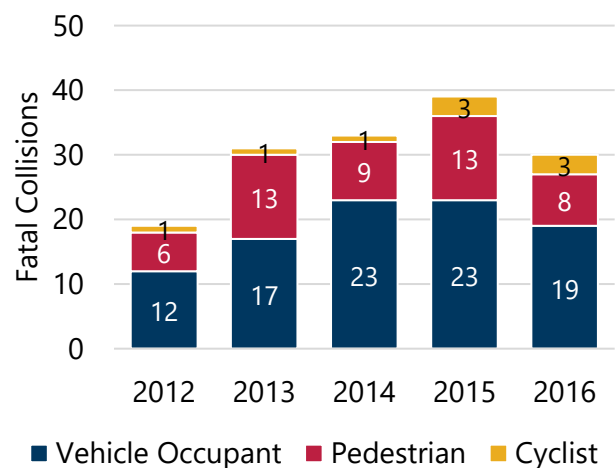
Note that the data presented in this plan does not include every severe and fatal collision that occurred in the county during the analysis period. The main areas excluded are the interstates, I-495 and I-270, and the City of Takoma Park. These areas were omitted for two reasons. First, MCPD's records did not include reports from the departments listed in the right column in the table below. Second, this action plan is designed to focus on areas where the County Government can best use its resources on roadways it maintains and can do enforcement.

Reports Included	Reports Not Included
Montgomery County PD	MD State Police
Rockville PD	MD Transit Authority
Gaithersburg PD	Takoma Park
	M-NCPPC Park Police
	Chevy Chase Police

SEVERE COLLISIONS, 2012-2016






FATAL COLLISIONS, 2012-2016



GEOSPATIAL ANALYSIS OF SEVERE AND FATAL COLLISIONS

HIGH INJURY NETWORK

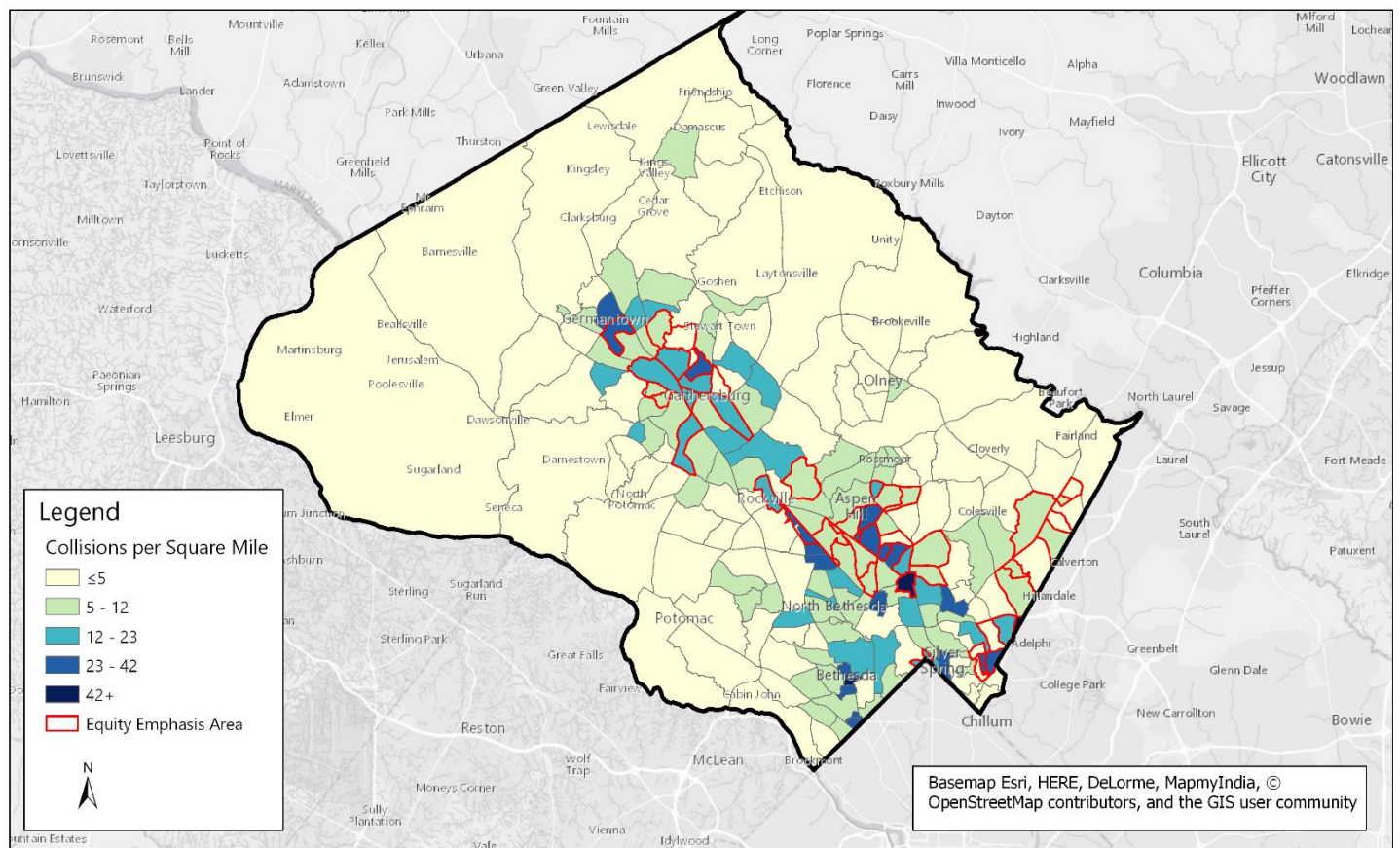
TOP 10 PRIORITY CORRIDORS FOR COUNTY-MAINTAINED ROADWAYS

Roadway	Total Collisions	 Injured or Killed	 Injured or Killed	 Injured or Killed	Collisions per Mile per Year	Collisions per 100M VMT**	Number of Lanes	Speed Limit
Crabbs Branch Way From Reland Rd to Indianola Dr	9	7	2	0	3.8	51.9	4	35 MPH
Middlebrook Rd* From Germantown Rd to I-270	15	14	1	0	2.6	33.1	6	40 MPH
Shady Grove Rd From Frederick Rd to I-270	14	12	2	0	2.7	18.3	6	40 MPH
Sam Eig Hwy From Fields Rd to Diamondback Dr	5	4	0	1	4.9	42.8	8	50 MPH
Randolph Rd* From Veirs Mill Rd to Rock Creek Park	9	7	1	1	2.6	30.7	6	35 MPH
Snouffer School Rd From Woodfield Rd to Flower Hill Way	9	6	3	0	2.0	25.4	4	40 MPH
Shady Grove Rd From Metro Access Rd to Midcounty Hwy	11	11	0	0	2.3	12.9	6	45 MPH
Bel Pre Rd* From Layhill Rd to Georgia Ave	10	7	3	0	1.0	12.5	4	35 MPH
Randolph Rd From Kemp Mill Rd to Glenallan Ave	9	6	3	0	2.0	13.6	6	45 MPH
Darnestown Rd From W Montgomery Ave to Shady Grove Rd	6	5	1	0	1.5	20.4	4	40 MPH

*Roadway overlaps with High Incidence Area for Pedestrian Safety Initiative

**VMT = Vehicle Miles of Travel

COLLISIONS AND EQUITY EMPHASIS AREAS



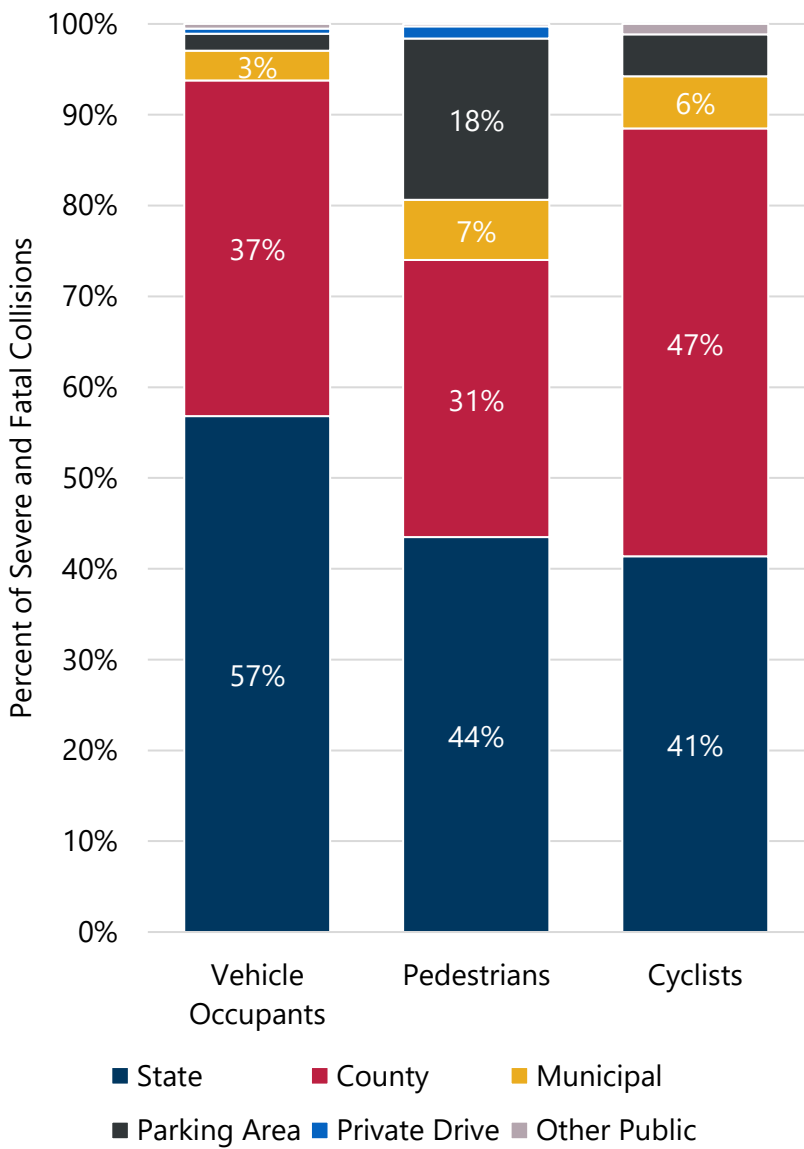
The Metropolitan Washington Council of Governments (MWCOG) analyzed Census data at the tract level to identify areas with significant concentrations of low-income and/or minority populations.¹ In Montgomery County, MWCOG found 46 neighborhoods that met the criteria and are highlighted with a red boundary in the map above. These neighborhoods comprised 6% of the County's land area and 22% of the population. When these areas were compared with crash and roadway data, 31%

SEVERE AND FATAL COLLISIONS BY ROADWAY OWNER

Roadways in Montgomery County fall under five main categories: state, county, municipal, other public (National and Maryland Parks), and private. The State of Maryland has primary jurisdiction over 17% of non-interstate lane miles in the County and 52% of all non-interstate vehicle miles traveled, which accounts for 53% of the County’s severe and fatal collisions.

Nearly two in 10 severe or fatal pedestrian collisions occurred in parking lots and garages. In the parking area collisions, 21% were the result of the vehicle backing, 18% were the result of the vehicle moving at a constant speed, and 13% were the result of the vehicle accelerating.

Cyclists had the highest rate of severe and fatal collisions on County maintained roadways at 49%. This should be expected given that State-maintained roadways are multi-lane highways that are stressful for cyclists and would have less overall volume of cyclists compared to local roads.

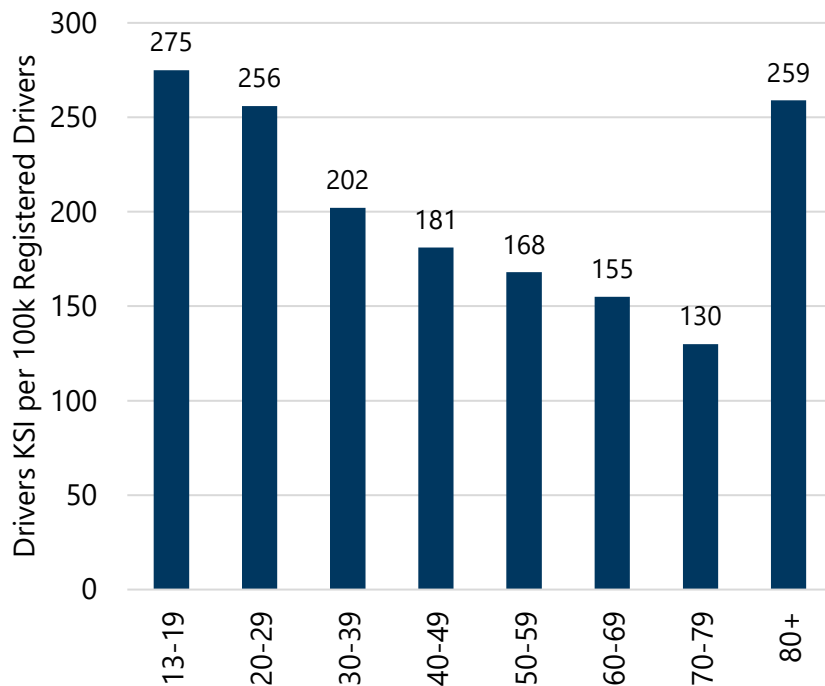


NON-INTERSTATE LANE MILES BY ROADWAY OWNER

	State	County	Municipal	Total
Lane Miles	1,167	4,877	773	6,817
Percent of Total	17%	72%	11%	100%

AGE OF PERSON SEVERELY INJURED OR KILLED

DRIVERS



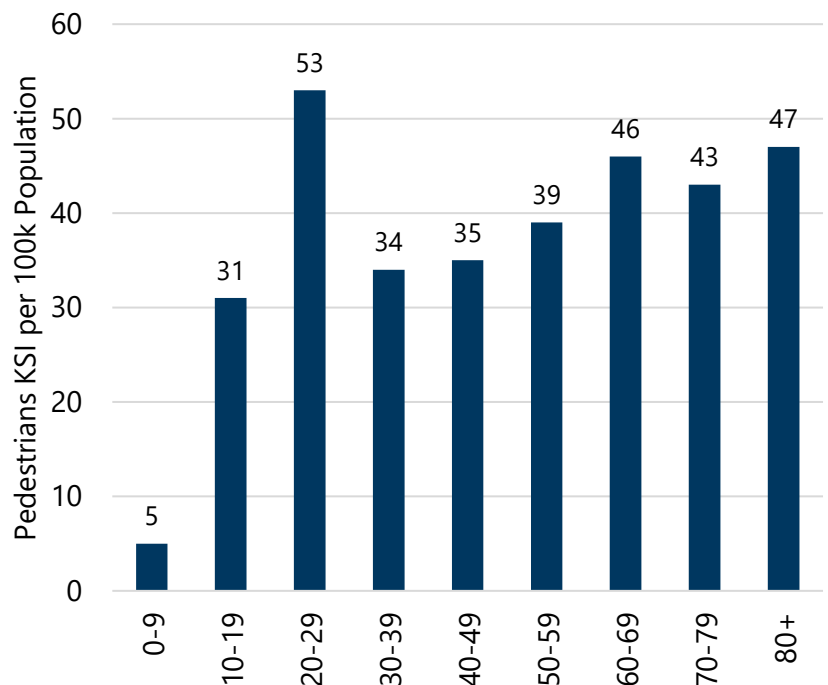
For drivers who were killed or severely injured (KSI), the highest rates were among the very youngest and oldest drivers. Drivers aged 13-29 and 80+ both share the same top three contributing factors of failing to give full time and attention, failing to yield the right of way, and driving too fast for conditions. A major difference was that younger drivers have higher rates of driving under the influence.

Strong outreach for the 80+ population is crucial as the 80+ population in Montgomery County is expected to grow by 116% by 2040 compared to only 6% for 15-29 year old residents.²

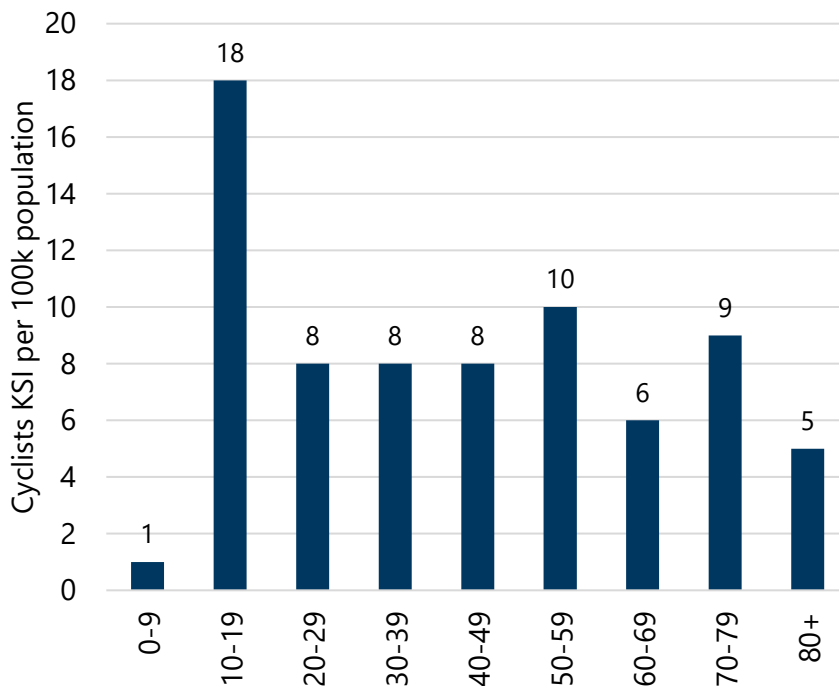
PEDESTRIANS

The age group with the highest number of killed or severely injured (KSI) were young adults ages 20 to 29. Within the 20 to 29 age group, the distribution leaned toward the older end with 63% of the age group falling between 25 and 29. This age group, and the 30 to 39 age group, were the most likely to have alcohol detected at the time of the collision.

When examining fatal pedestrian collisions, the opposite is true: the highest fatality rates were among the 60+ age group and the lowest per capita rate was among the 0 to 9 and 30 to 39 year old age group.



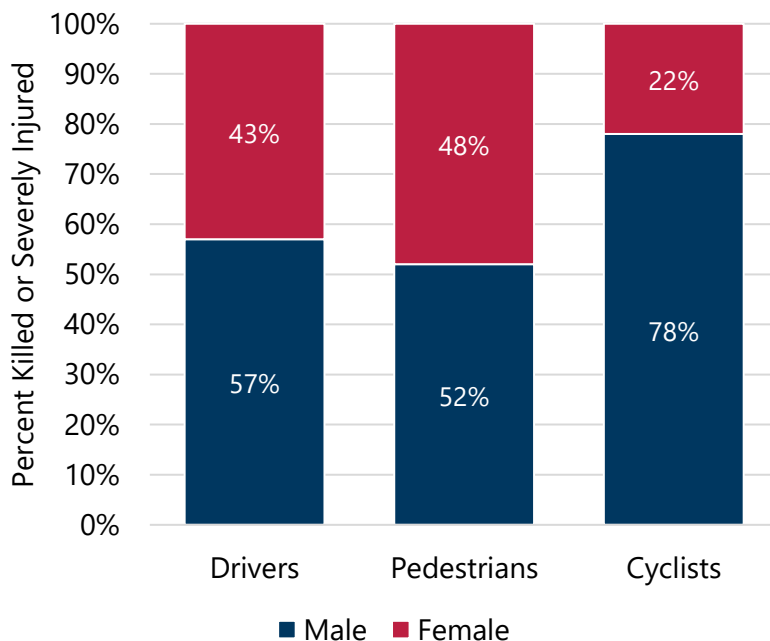
CYCLISTS



The killed or severely injured (KSI) rates for cyclists were highest among school-aged children ages 10 to 19. Within that age group, 78% were high-school aged (15–18 years old) and 78% were male.

With the eight fatal cyclist collisions between 2012 and 2016, there was no significant trend amongst the age groups. There were two in the 10 to 19 year old, ages 17 and 19, and three were aged 60+.

SEX OF PERSON SEVERELY INJURED OR KILLED



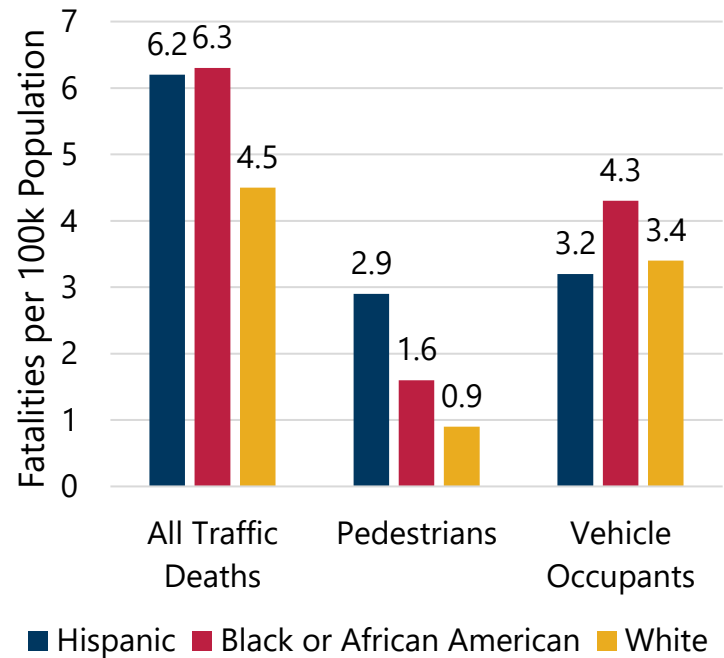
The County's overall population is 52% female and 48% male. However, males were the majority for those severely injured or killed. The largest imbalance was amongst cyclists with 78% being male. Males were more likely to engage in dangerous behaviors (intoxicated, not wearing seatbelt, speeding) compared to females.

For vehicle passengers severely injured or killed, the trend mirrors the County demographics with 52% female, 47% male, and 1% unknown.

ETHNICITY AND RACE OF PERSON KILLED

Traffic fatalities are disproportionately higher for persons of color. Hispanic and Non-Hispanic Black/African American residents had a fatality rate 33% higher than Non-Hispanic White residents. For pedestrians, the Hispanic fatality rate was 105% higher than the Non-Hispanic White rate. Hispanics and Non-Hispanic Whites had similar fatality rates for vehicle occupants, but Non-Hispanic Black/African Americans were 23% higher.

Further analysis between ethnicity, race, and collision factors is not possible at this time. Race information was not collected in the County's records and 27% of fatalities had no information on ethnicity or race in the Fatality Analysis Reporting System for Montgomery County covering 2011 to 2015. Reliable data on race and motor vehicle collisions came from the Centers for Disease Control's database tracking the cause of death for County residents

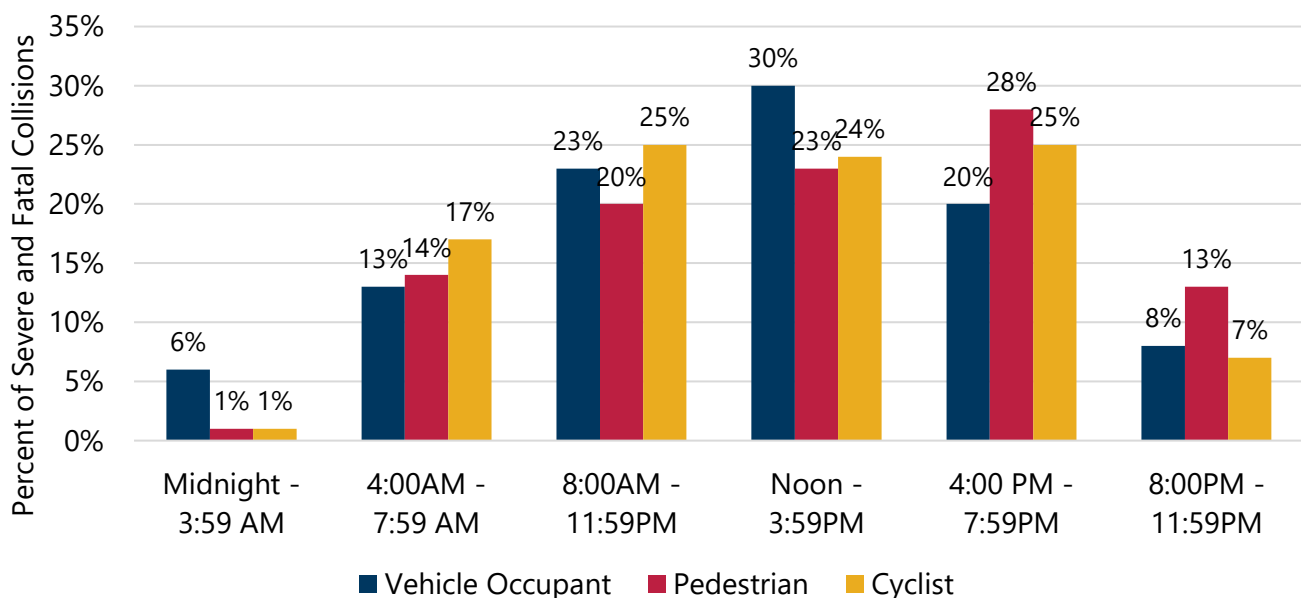


Source: Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 2011-2015 on CDC WONDER Online Database, released December 2016.

Note: Rates for cyclists and Asian/Pacific Islander not shown due to rates that fell below the reporting threshold.

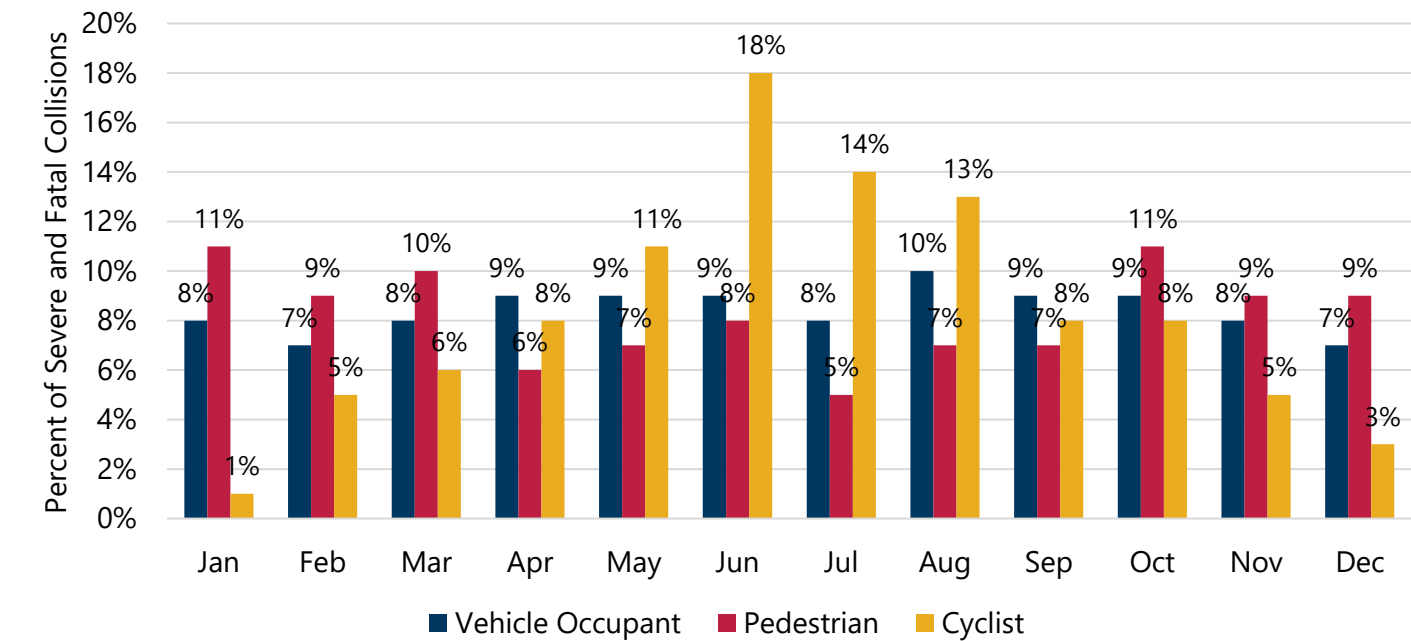
SEVERE AND FATAL COLLISIONS BY TIME OF DAY

COLLISIONS BY TIME OF DAY



NOTE: Total may not add to 100% due to rounding at each 4-hour period.

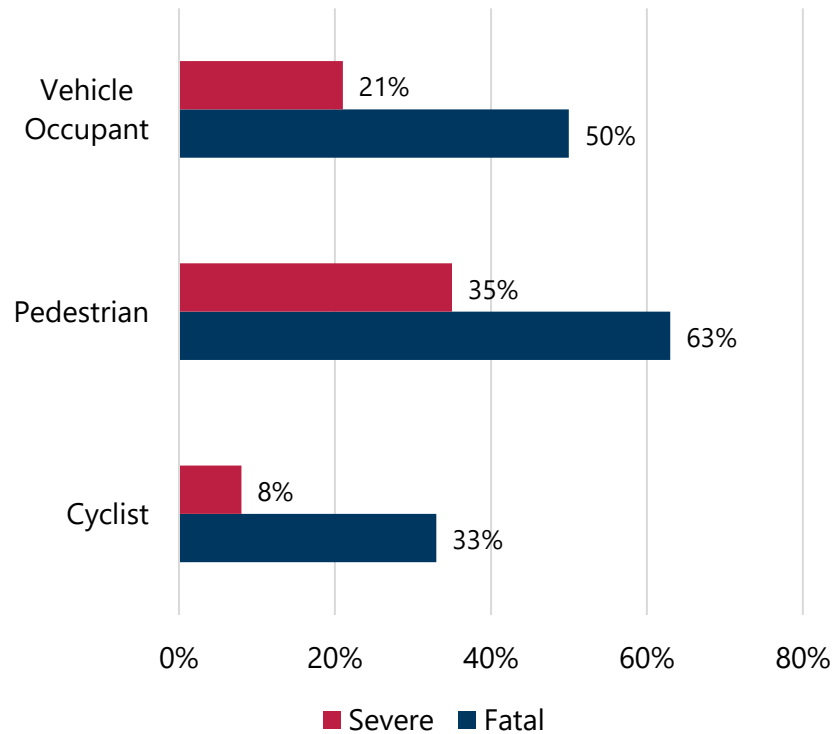
COLLISIONS BY TIME OF YEAR



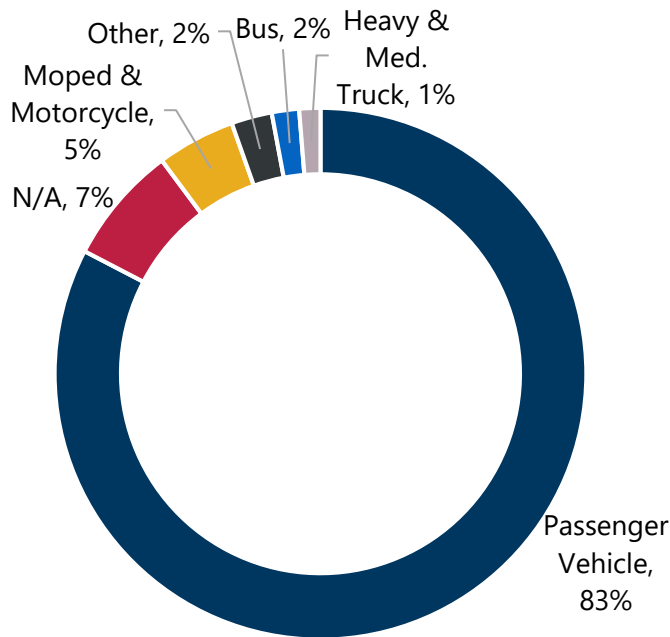
NOTE: Total may not add to 100% due to rounding at each month.

COLLISIONS OCCURRING BETWEEN DUSK AND DAWN

Previous analyses conducted as part of the Pedestrian Safety Initiative found a negative correlation between the number of hours of daylight in a month and the number of pedestrian collisions.³ Lighting was also a factor for fatalities of vehicle occupants and cyclists. A higher percentage of fatal collisions happened in the dark compared to severe collisions and were the majority for pedestrians. The luminosity was not the only factor in the nighttime collisions. The majority of collisions where the officer detected alcohol occurred at night.



VEHICLE BODY TYPE INVOLVED IN COLLISION










Passenger vehicles (cars, SUVs, and pickup trucks) were involved in 83% of severe and fatal collisions. This percentage was consistent across the injured persons type with 82% for vehicle occupants, 84% for pedestrians, and 89% for cyclists. Larger vehicles such as tractor trailers are a small piece of the total, but these data shown here exclude the freeways where there is more truck traffic.

Particularly important for local government are the number of collisions involving transit and emergency vehicles. There were 53 (2%) severe and fatal collisions involving buses and 22 (1%) involving police, fire, and emergency medical services vehicles. While the drivers of these vehicles are rarely at fault (the highest being 14% at fault for buses), local government must prioritize safe operations of its fleet.

MOTOR VEHICLE OCCUPANT COLLISIONS

COLLISION TYPE

Collision Type	% of Single or Vehicle-to-Vehicle Collisions	
	Severe	Fatal
 Same Direction Rear End	27%	3%
 Left Turn	19%	11%
 Straight Movement Angle	19%	15%
 Single Vehicle	18%	50%
 Head On	7%	12%
 Sideswipe	4%	3%
Other	3%	5%
 Right Turn	2%	1%
Unknown N/A	1%	0%

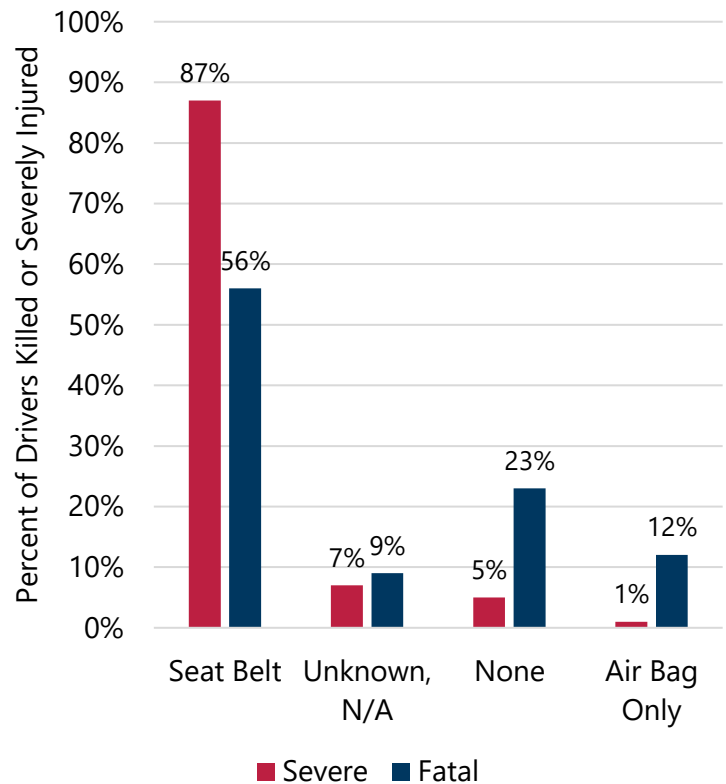
Same direction, rear end collisions were the primary collision type for severe vehicle occupant collisions, but make up only a small fraction (3%) of fatal collisions. The top contributing factors for the rear end collisions were failing to give time and attention, following too closely, too fast for conditions, and inattentiveness. Weather was not a major factor in rear-end collisions as 17% occurred when the roads were wet compared to 16% for all other collision types.

Half of all 47 vehicle occupant fatalities involved only one vehicle. In 91% of these fatal collisions, the vehicle struck a fixed object. The object struck in 48% of the collisions was a tree and 36% hit a pole. These collisions are much more likely to occur late at night and early morning: 49% of fatal single vehicle collisions occurred between 10PM and 4AM compared to 13% for other collision types.

Similar to national trends,⁴ left turns are responsible for 18% of severe and fatal collisions while right turns account for only 2%. In 68% of left turn collisions, the driver at fault failed to yield the right of way, 46% failed to give full time and attention, and 15% failed to obey the traffic control device or officer. New York City's analysis noted that left turns are more dangerous than right turns because left turns can be taken at a wider turn radius which leads to higher turn speeds, visibility is slightly obscured by parked cars and the vehicle's A-pillar, and left turns are more complicated to navigate compared to right turns.⁵

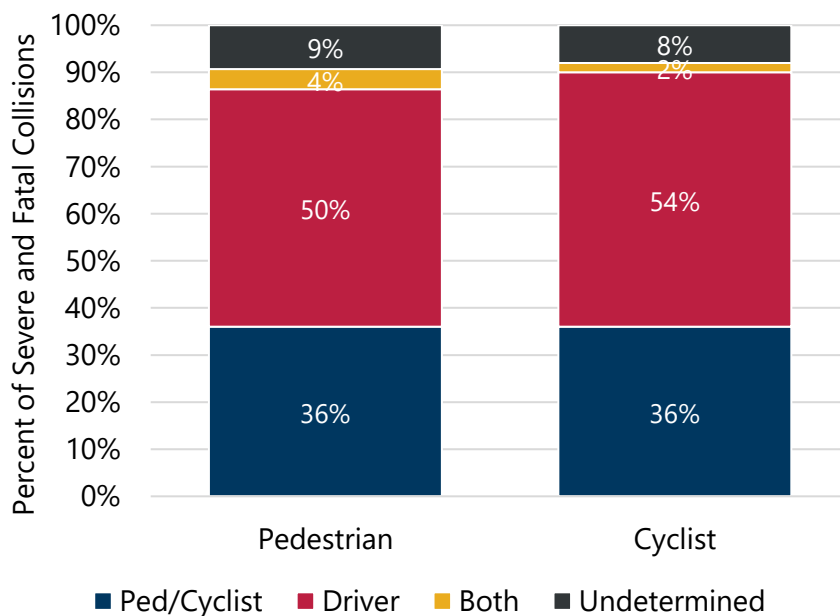
DRIVER SAFETY EQUIPMENT USED

Seatbelts are life savers. Drivers in Montgomery County killed in roadway collisions had significantly lower seatbelt utilization rates compared to those severely injured. The National Highway Traffic Safety Administration estimated seat belts saved 13,941 lives across the US in 2015 alone. Seatbelts also lower the risk of fatalities by 45% and moderate-to-severe injuries by 50% for occupants in the front seat. The State of Maryland and Montgomery County have higher seatbelt utilization rates than the national average, but getting to zero will require improving seatbelt usage even further.⁶



PEDESTRIANS AND CYCLISTS

PARTY AT FAULT

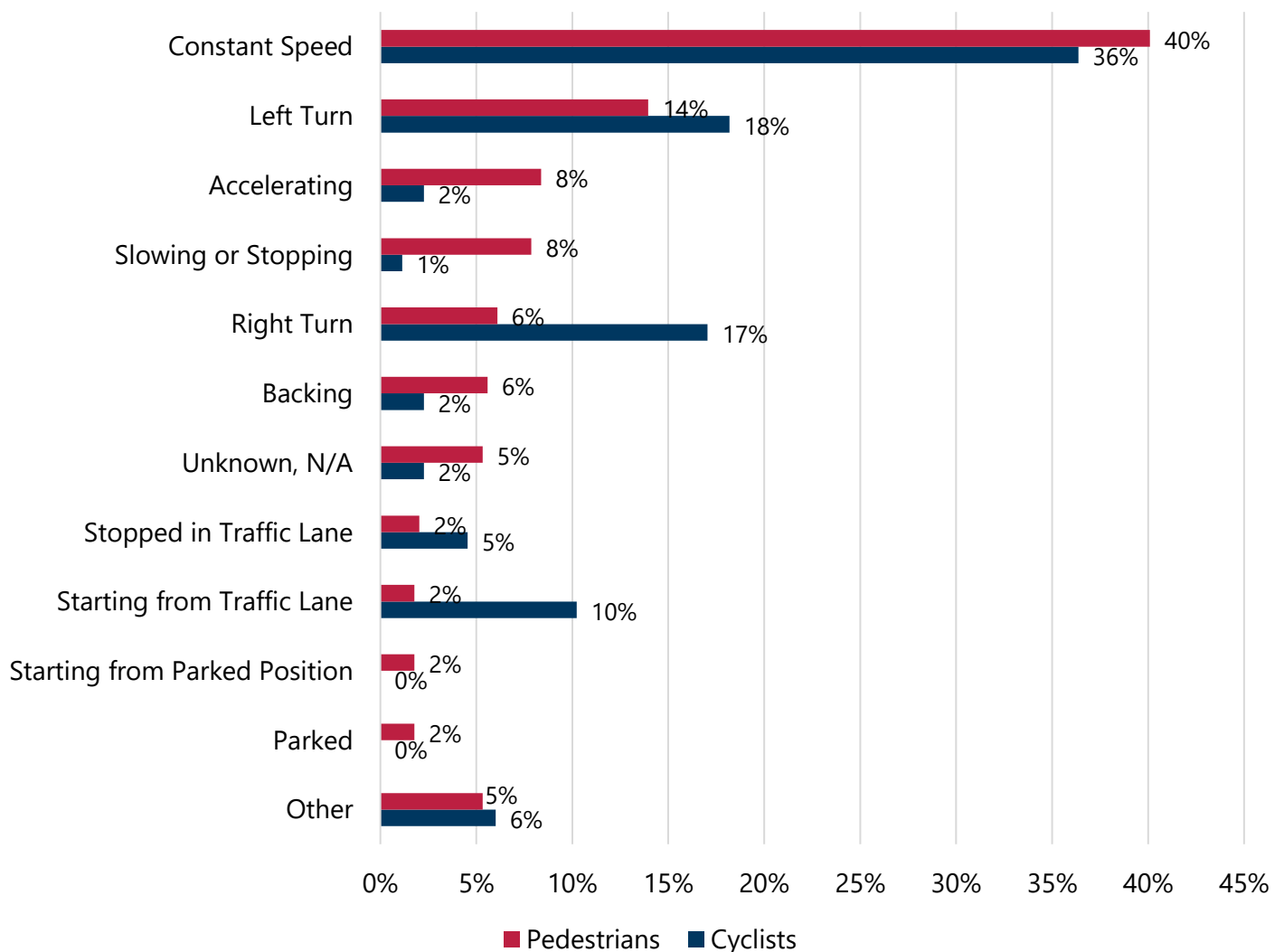


Thirty-six percent of pedestrians and cyclists were at fault in severe and fatal collisions. When pedestrians are at fault, the top contributing circumstances are illegally in roadway, failed to give time and attention, clothing not visible, and under the influence of alcohol. The top contributing circumstances for cyclists at fault were failed to yield right of way, illegally in roadway, bicycle violation, and failed to give full time and attention.

MOVEMENT OF MOTOR VEHICLES INVOLVED

In severe and fatal pedestrian and cyclist crashes, the top vehicle movements were moving in a constant speed, followed by left turns. While pedestrians were twice as likely to be severely injured or killed in a left turn collision compared with right turn, there was an even split between left and right turns for cyclists. When the pedestrian was struck by a vehicle moving at a constant speed, the pedestrian was crossing the road 69% of the time, with 53% of those crossing at an intersection and 47% not crossing at an intersection. For cyclists colliding with vehicles moving at a constant speed, there was an equal likelihood of colliding with the vehicle while crossing at an intersection as riding along with traffic.

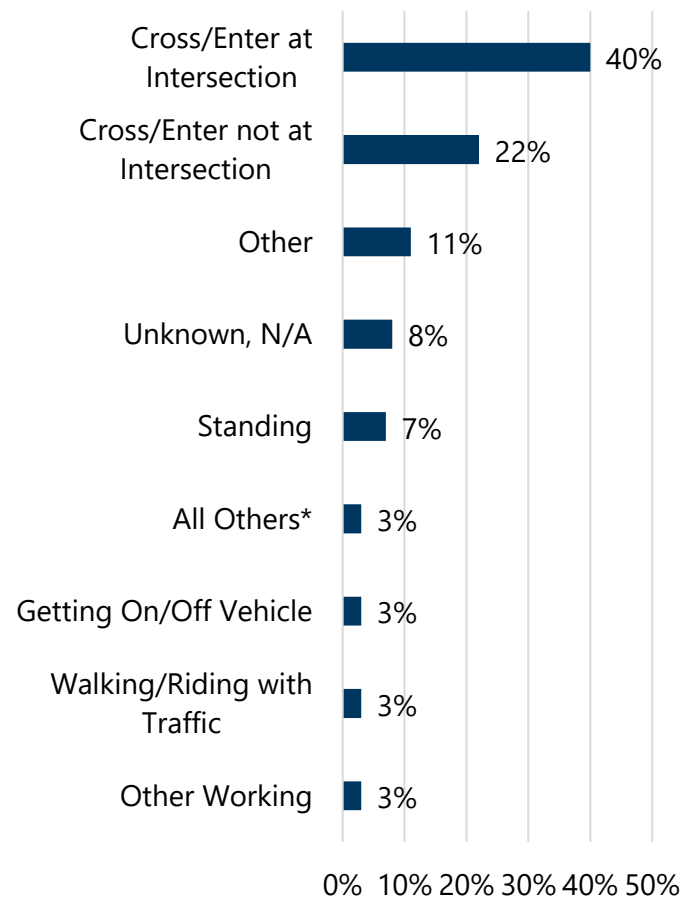
MOTOR VEHICLE MOVEMENT AT TIME OF COLLISION



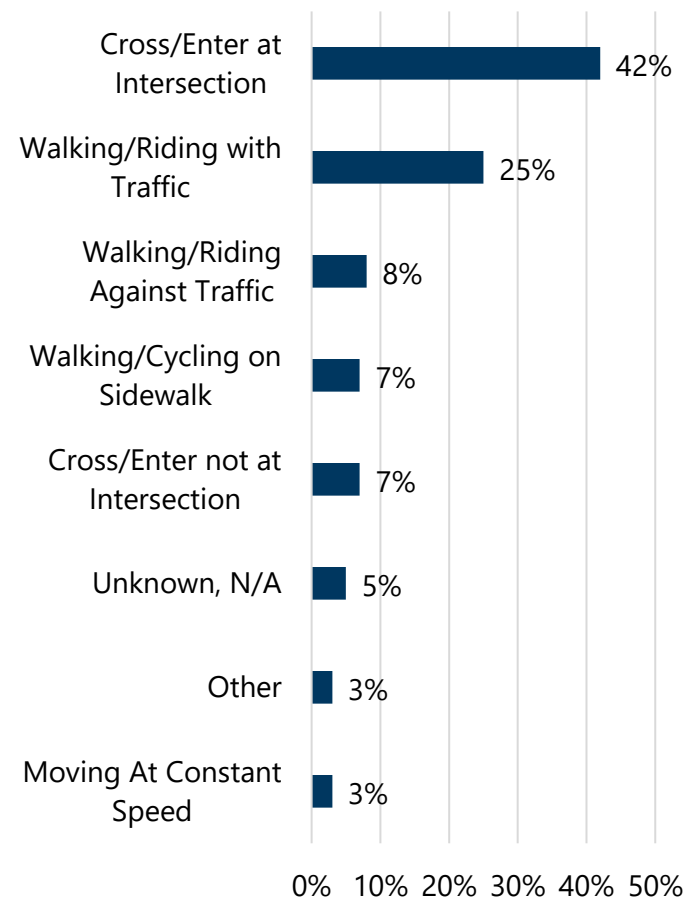
MOVEMENT OF PEDESTRIANS AND CYCLISTS INVOLVED

The danger for pedestrians and cyclists came from crossing or entering at an intersection; the most common area for conflicts between motor vehicles and pedestrians and cyclists to occur. This movement was linked to 40% and 42% of the severe and fatal collisions for pedestrians and cyclists, respectively. Overall pedestrians crossing not at an intersection was 22% of the total, but in cases where the pedestrian was found to be at-fault, that number jumps to 43%. For cyclists, riding with traffic was second at 25% followed by riding against traffic at 8%.

PEDESTRIANS



CYCLISTS



*Includes playing, walking to/from school, walking against traffic, push/work on vehicle, approaching/leaving school bus, staring from parked position, and walking on sidewalk

OTHER TRENDS SHAPING THE MONTGOMERY COUNTY CONTEXT

The collision data tell only part of the story concerning roadway safety in Montgomery County. The County must utilize demographic data to tailor its outreach efforts for the diverse population and unique conditions that exist throughout the County. For example, an examination of nationwide pedestrian fatalities found disproportionate fatality rates in areas with higher poverty rates.⁷ In executing this plan, implementers of the high injury area safety audits will utilize demographic data to develop unique profiles for each area.

DEMOGRAPHICS

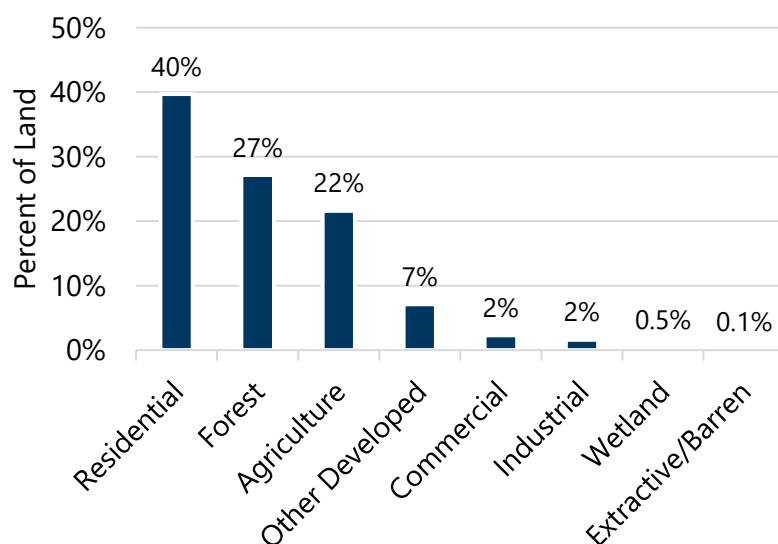
The County's 2016 population of 1,043,863 residents has increased 7.4% since 2010 and is projected to increase to 1,206,800 by 2040.^{8,9} In 2010, the County flipped to a majority minority jurisdiction and is home to four of the top ten most diverse cities in America.¹⁰ Despite being one of the wealthiest counties in the US, nearly 70,000 Montgomery County residents live below the poverty line.

SELECT CHARACTERISTICS FOR MONTGOMERY COUNTY COMPARED TO US

Characteristic	Montgomery County	United States
Median Household Income	\$99,435	\$53,889
Median Age	38.9	37.8
Limited English Speaking Households	7.0%	4.5%
Residents in Poverty	6.7%	15.5%
Foreign Born Residents	33.0%	13.0%
Population 25 Years and Older with Graduate or Professional Degree	31.3%	11.2%

Source: "Table S0501 – Selected Characteristics of the Native and Foreign-Born Populations: 2011–2015 American Community Survey 5-Year Estimates" *US Census Bureau*, 2015.

LAND USE



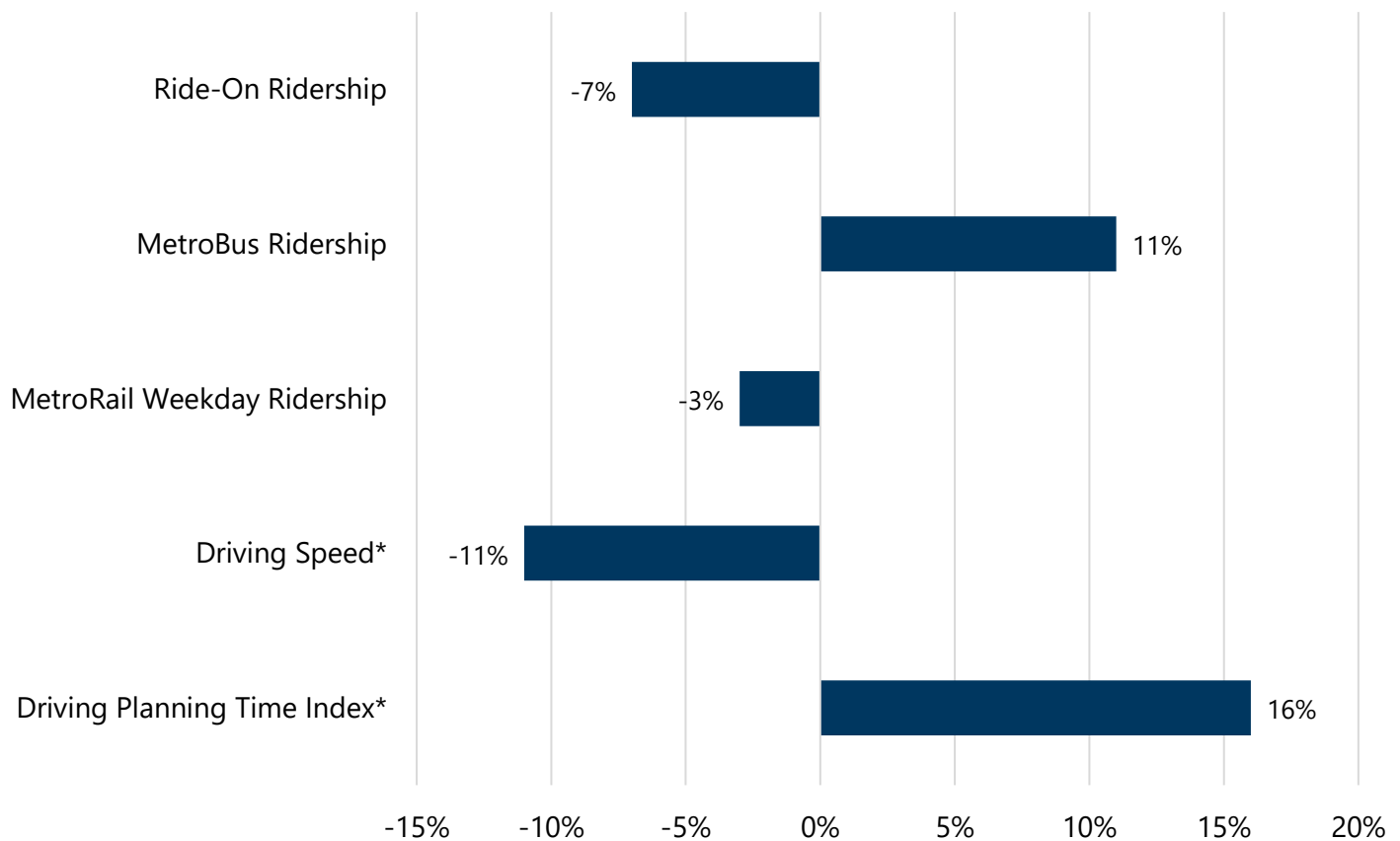
Montgomery County's 491.25 square miles cover a wide spectrum of different land uses. The pastoral 145 square mile Agricultural Reserve spans much of the northern tier of the county whereas communities inside the beltway like Bethesda and Silver Spring have neighborhoods of up to 31,073 persons per square mile. Forest and agriculture make up nearly half (49%) of land use in the county followed by residential areas.

Source: "Montgomery County", *Maryland Department of Planning*, 2010, <http://planning.maryland.gov/PDF/OurWork/LandUse/County/Montgomery.pdf>.

MOBILITY AND TRANSIT USE

Vision Zero must reconcile the paramount need for safe streets with the reality of growing traffic congestion and declining public transit ridership. The most recent county-wide resident survey in 2009 showed traffic congestion as one of the three most important issues the County should address.¹¹ Since that survey, traffic congestion has worsened in the County with planning time index (a measure of travel time reliability) growing 16% from 2011 to 2015. Ridership is down or steady for mass transit in the County, with Metrorail weekday entries and exits down 3% and bus boardings (Metrobus and Ride-On) steady between 2010 and 2015- despite population growth.¹² Tackling congestion and transit ridership are issues that must be acknowledged when transforming high injury areas and creating low risk transportation choices.

CHANGES FROM FY10 TO FY15



*Data are for calendar years 2011 to 2015

Source: "Mobility Assessment Report February 2017," (presentation to the Montgomery County Planning Board, February 14, 2017), <http://montgomeryplanning.org/wp-content/uploads/2017/02/2017MARPresentation.pdf>.

PHOTO AND ICON CREDITS

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ENDNOTES

¹ "Equity Emphasis Areas for TPB's Enhanced Environmental Justice Analysis," *Metropolitan Washington Council of Governments*, 2017, <https://www.mwcog.org/transportation/planning-areas/fairness-and-accessibility/environmental-justice/equity-emphasis-areas/>.

² "Projections," *State of Maryland Department of Planning*, 2015, http://www.mdp.state.md.us/msdc/s3_projection.shtml.

³ "2014 Pedestrian Safety Initiative," *Montgomery County CountyStat*, 2017, <https://reports.data.montgomerycountymd.gov/en/dataset/Ped-Safety-Web-Version/fmkw-w6ux>.

⁴ "Crash Factors in Intersection-Related Crashes: An On-Scene Perspective," *NHTSA National Center for Statistics and Analysis* (Washington, DC: U.S. Department of Transportation, 2010), <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/811366>.

⁵ "Don't Cut Corners: Left Turn Pedestrian & Bicyclist Crash Study," *New York City Department of Transportation*, Aug 2016, <http://www.nyc.gov/html/dot/downloads/pdf/left-turn-pedestrian-and-bicycle-crash-study.pdf>.

⁶ "Occupant Protection in Passenger Vehicles," *NHTSA National Center for Statistics and Analysis* (Washington, DC: U.S. Department of Transportation, 2017), <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812374>

⁷ Mike Maciag, "Pedestrians Dying at Disproportionate Rates in America's Poorer Neighborhoods," *Governing*, August 2014, <http://www.governing.com/topics/public-justice-safety/gov-pedestrian-deaths-analysis.html>.

⁸ "Quickfacts" *US Census Bureau*, 2017, <https://www.census.gov/quickfacts/table/PST045216/24031,00>.

⁹ "Projections," *State of Maryland Department of Planning*, 2015, http://www.mdp.state.md.us/msdc/s3_projection.shtml.

¹⁰ Richie Bernardo, "2017's Most Diverse Cities in America," *WalletHub*, May 4, 2017, <https://wallethub.com/edu/most-diverse-cities/12690/>.

¹¹ *Montgomery County, MD 2009 Resident Survey: Final Report of Results December 2009*, (Colorado: National Research Center, 2009), http://www.montgomerycountymd.gov/opi/resources/files/pdf/2009_resident_survey_report.pdf.

¹² "Mobility Assessment Report February 2017," (presentation to the Montgomery County Planning Board, February 14, 2017), <http://montgomeryplanning.org/wp-content/uploads/2017/02/2017MARPresentation.pdf>.